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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/930,295	08/16/2001	Alan G. Wood	M4065.0184/P184-A	9495

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DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP
2101 L STREET NW
WASHINGTON, DC 20037-1526

EXAMINER

CHU, CHRIS C

ART UNIT PAPER NUMBER

2815

DATE MAILED: 07/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/930,295

Applicant(s)

WOOD ET AL.

Examiner

Chris C. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25, 26 and 28 - 34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25, 26 and 28 - 34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The preliminary amendment filed on April 24, 2003 has been received and entered in the case.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

3. Claims 25 and 28 ~ 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Heo.

Regarding claim 25, Heo discloses in Fig. 6 a semiconductor device package,
comprising:

- a semiconductor device (10) having diced edges;

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- a dielectric substrate (22, at the top) having diced edges;
- a metal layer (21) formed between said semiconductor device and said dielectric substrate, said metal layer having diced edges;
- a ball grid array (60) on said dielectric substrate, said dielectric substrate and said metal layer being located between said semiconductor device and said ball grid array;
- and
- electrical connections (40) between said semiconductor device and said ball grid array,
- wherein said metal layer has a stiffness sufficient to enable simultaneous dicing of said semiconductor device edges, said dielectric substrate edges, and metal layer edges, so as to provide said package with aligned edges.

Further, the phrase “simultaneous dicing of said semiconductor device edges, said dielectric substrate edges, and metal layer edges” is product-by-process language, even though product-by-process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted). A “product by process” claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 116; *In re Wertheim*, 191 USPQ 90 (209 USPQ 254 does not deal with this issue); and *In re Marosi et al.*, 218 USPQ 289

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final product per se which must be determined in a “product by, all of” claim, and not the patentability of the process, and that an old or obvious product, whether claimed in “product by process” claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Regarding claim 28, Heo discloses in column 3, lines 45 and 46 said metal layer (21) being arranged to dissipate heat from said semiconductor device.

Regarding claim 29, Heo discloses in column 3, line 5 said metal layer (21) comprising copper.

Regarding claim 30, Heo discloses in Fig. 6 said connections (40) comprising wire bonds.

Regarding claim 31, Heo discloses in Fig. 6 said connections (40) comprising conductive vias (the bottom place of solder ball in layer 24).

Regarding claim 32, Heo discloses in Fig. 6 said connections (40) further comprising conductive traces (23) on opposite sides of said substrate.

Regarding claim 33, Heo discloses in Fig. 6 a semiconductor device package, further comprising solder bumps (11) on said semiconductor device, said bumps connected to said traces.

Regarding claim 34, Heo discloses in Fig. 6 an insulative solder mask (24) for covering said dielectric substrate

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4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heo in view of Marcantonio.

Regarding claim 26, Heo discloses the claimed invention except for said metal layer providing a ground plane for said electrical connections. However, Marcantonio discloses in Fig. 6 and column 5, lines 63 ~ 65 that a metal layer (414) providing a ground plane for an electrical connections. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Heo by using the metal layer as the ground plane for an electrical connections as taught by Marcantonio. The ordinary artisan would have been motivated to modify Heo in the manner described above for at least the purpose of providing Faraday shielding for the BGA package (column 2, line 33).

Response to Arguments

6. Applicant's arguments filed on April 24, 2003 have been fully considered but they are not persuasive.

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Applicant argues “applicant’s claimed semiconductor device package is different from the structure disclosed by Heo. By virtue of the metal layer’s stiffness, Applicant’ claimed package has semiconductor device edges, dielectric substrate edges, and metal layer edges that are *aligned* with one another because they are simultaneously diced.” This argument is not persuasive. Heo clearly shows in Fig. 6 semiconductor device edges (10), dielectric substrate edges (22, at the top), and metal layer edges (21) that are *aligned* with one another. Inherently, any metal layer has stiffness. Thus, the metal layer (21) in Heo has stiffness.

Further, applicant’s arguments concerning the how the dicing of the chip is done, e.g. “... the edges can be simultaneously diced ...” are not persuasive because these arguments are considered to consist of “product by process” limitations which are unpatentable over Heo since they don’t distinguish the claimed device from what is disclosed by Heo.

For the above reasons the rejection is maintained.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu
Examiner
Art Unit 2815

c.c.
July 2, 2003


JEROME JACKSON
PRIMARY EXAMINER